

# Organs with endocrine functions

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## Kidney

secret  
stimulate  
regulate  
1. Renin- Angiotensin Aldosterone  
blood pressure <sup>1</sup> and volume <sup>2</sup>

Antidiuretic hormone ( vasopressin) from posterior hypothalamus

secreted from  
2. Erythropoietin ( glycoprotein hormone)  
Extraglomerular mesangial cells

Hypoxia ①

effect of Erythropoietin.  
Stimulate bone marrow to produce erythrocytes ②

\* Factors that help in its secretion. (stimulator)

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3. Calcitriol (lipid soluble hormone) and active form of vitamin D

Increase calcium and phosphate in the blood by two ways:

- ① Increase the ability of gut and intestinal cells to absorb more calcium and phosphate
- ② Bone resorption (increases the amount of bone matrix that break down and release calcium and phosphate ion into the blood)

\* supraoptic nucleus connects with posterior pituitary via hypothalamo-hypophysial tract.

## Mechanism of secretion of ADH

from posterior pituitary

Synthesized in Supraoptic nucleus of hypothalamus

Store it in posterior pituitary

\* stimulators for secretion: ○

Low blood pressure [1]

Angiotension II [2]

\* supraoptic nucleus → binds post. pituitary with hypothalamus.

\* paraventricular nucleus binds Ant. Pituitary with hypothalamus.

< posterior hypothalamic nucleus. binds the sympathetic with hypothalamus.

High Plasma osmolality [3] the percent of solute is higher than that of water.

stimulate ↓

Osmoreceptors → it's kinds:

organo vasculosom of lamina terminalis [1]

sub fanikular organ [2]

found on supraoptic nucleus

# Effect of ADH

\*V<sub>2</sub>: Receptor on P-cells.

(P-cells)

Principle cells in the collecting duct

ADH → Binds to V<sub>2</sub>, G stimulatory protein, GTP, adenylate cyclase, ATP, Camp, P.K.A, Aquaporins

② plug to the membrane

⇒ The water passes through into the cell not secreted into the urine

The water moves to the blood

\*cause ∴ Increase the blood volume and decreases the osmolality (isotonic)

Aquaporins 3 and 4 basolateral membrane

ADH

Bind to V<sub>1</sub> in the blood vessels, vasoconstriction,  
Increase TPR, Increase blood pressure

Diabetes insipidus (trauma to the head)

Decreases ADH ←

Polyuria (water urea) ①

Polydipsia ②

Tumor (increase ADH) ←

[Syndrome of inappropriate ADH secretion]  
(SIADH)

causes Cerebral edema (the body has alot of water)

# Heart

Cardiac myocytes in the upper chamber of the heart

secret

Atrial natriuretic peptide

inhibits the secretion of ~~ADH~~ aldosterone

caused by  
by

Decrease blood pressure (1)

Vasodilator

Decreases blood volume (2)

Increase Na<sup>+</sup> excretion

Aldosterone ↓ ↓ ↓

Skin secret

Cholecalciferol (vitamin D2)

(Pre hormone) → Inactive v.D3

synthesis

UV radiation, cholecalciferol in the skin, liver to transform into calcidiol to

(calcitriol) kidneys (~~converts to~~ its active form)

Liver secret

function:

Angiotensin (regulate blood pressure)

Thrombopoietin (glycoprotein)

function:

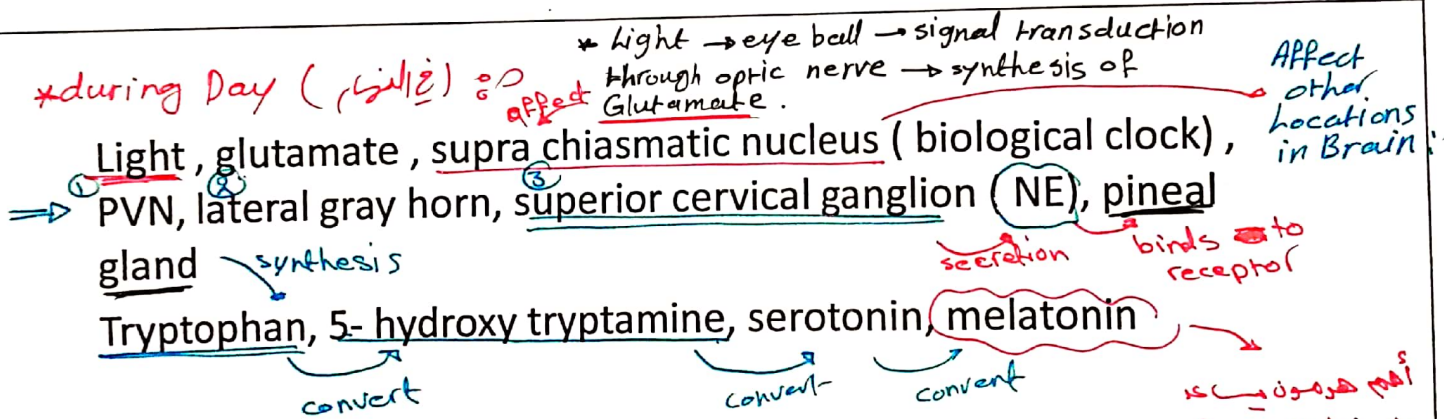
Produce platelet (blood clotting)

# Pineal Gland or body ( third EYE)

Found in

deep in Gray cortex

[Diencephalon] ( thalamus <sup>1</sup>, hypothalamus <sup>2</sup> ( supra chiasmatic nucleus ), epithalamus <sup>3</sup> consist of pineal gland and habenular commissure )



\* NE higher during darkness and increase the melatonin (inhibition)

\* during the day NE decrease and thus melatonin (stimulation)

Melatonin binds to supra chiasmatic nucleus to regulate Sleep and wake cycle (diurnal cycle)

Let you feel to sleep.

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